Toward a National Resilience Framework & Climate Resilience Information System (CRIS)

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VISION:

A national climate resilience framework, supported by an integrated information system, designed to scale up and accelerate the pace of resilience planning — equitably, inclusively, and at reduced cost — all across the nation.

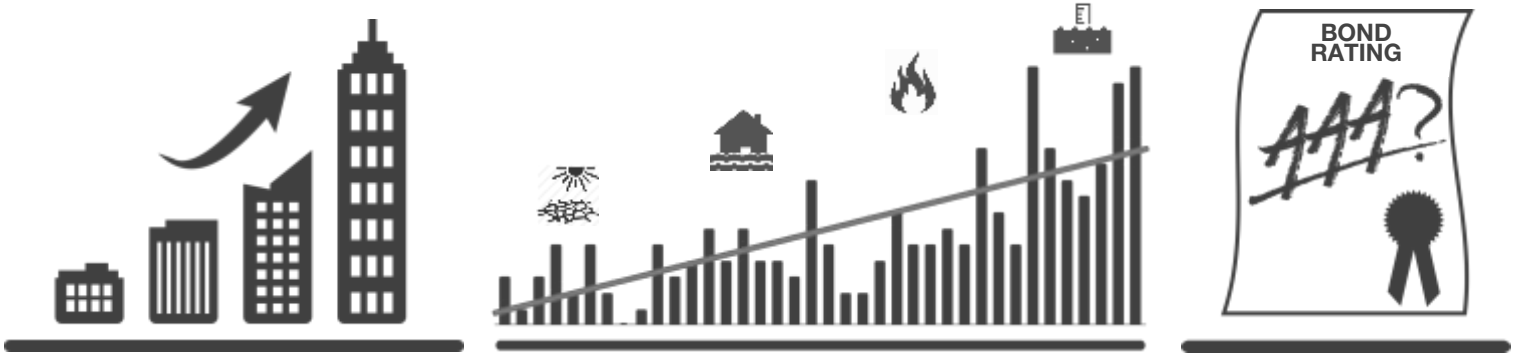
HYPOTHESIS:

Much of the information, tools, and methodologies we need to succeed already exist. Now we need the right vision, leadership, expertise, funding, and a trained workforce working together in an inclusive, all-of-society effort to build a national climate resilience framework, supported by an integrated data & information system.

Overview

1. Summary of the Problems
2. Additional Motivation
3. Climate Resilience Information System
4. CRIS: Key Part of a National Resilience Framework

Summary of the Problems

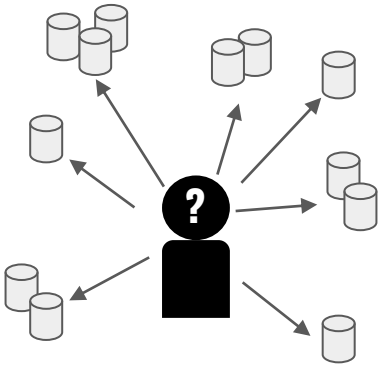


GROWING COMMUNITIES

CLIMATE-DRIVEN DISASTERS

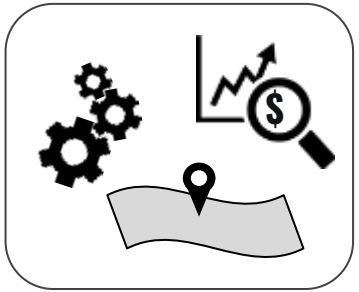
INCREASING RISK

Summary of the Problems (continued)



ACCESS, UNDERSTAND & USE FEDERAL DATA

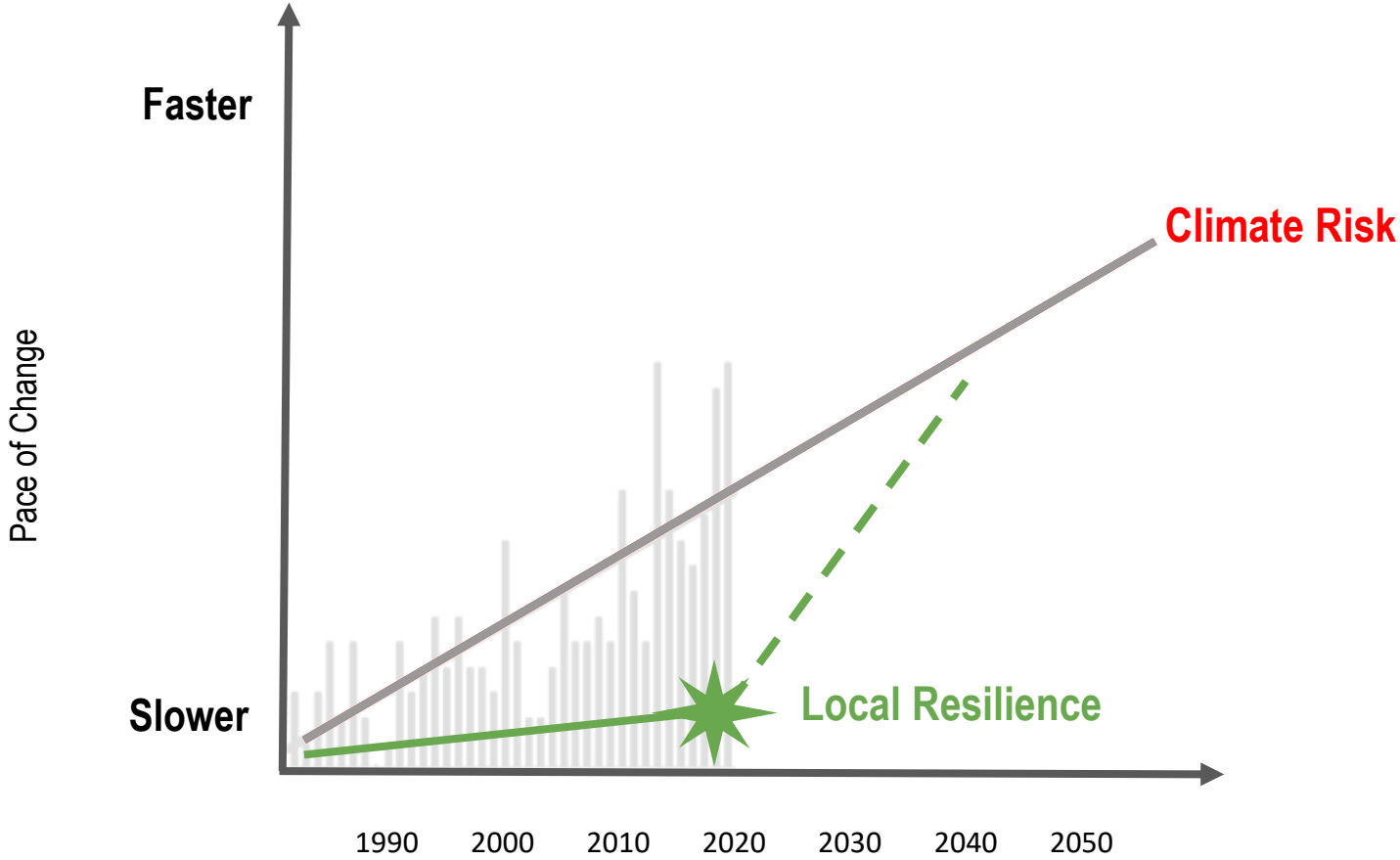
INTEGRATE FEDERAL DATA WITH LOCAL DATA



LOCAL INFO HUBS FOR KNOWLEDGE-SHARING

Source: 18F report to NASA & NOAA

When will resilience building catch up with climate change?



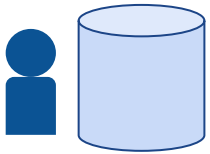
From "In Harm's Way… by John Cleveland and Peter Plastrik, 2021

ADDED MOTIVATION:

"Federal, state, and local governments need information now on climate-related risks to safeguard infrastructure, inform rulemaking, manage natural resources, protect the health and well-being of all Americans, and create opportunities. The private sector, landowners and ocean-users, and civil society need data, information and knowledge to plan and act. It is imperative, therefore, that the ***scientific information produced by the Federal government be readily accessible, understandable, and usable by all citizens. USGCRP should be the nexus for developing systems to provide climate knowledge to the world****."*

— the Honorable Dr. Jane Lubchenco
Deputy Director for Climate and Environment
Office of Science and Technology Policy
Executive Office of the President

We are part of a larger ‘Resilience Ecosystem’



FEDERAL SCIENCE & DATA EXPERTS

Provide research, data, modeling, analys & impact assessments of past & future climate

CLOUD HOST SERVICES

Offer big data hosting, computation, & public browse, formatting, access services

DESIGNERS OF GIS & ANALYTIC TOOLS

Bring data & analysis tools from federal & local sources together in geospatial context

ADAPTATION PRACTITIONERS

Offer guidance and translation services to help communities & businesses plan & take action

DECISION MAKERS

In gov’t, business, & resources mgmnt — responsible for local planning & action to protect people and property

The USCRT's 5 'Steps to Resilience'

U.S. Climate Resilience Toolkit
toolkit.climate.gov

A co-production of knowledge process that synthesizes information from multiple sources to...

1 EXPLORE HAZARDS

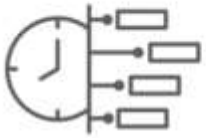
Identify & map exposure of all valued assets to climate-related hazards.

2 VULNERABILITY & RISK

Assess vulnerability & risk for all valued assets threatened by climate hazards. Rank most urgent threats to address.

3 OPTIONS

Brainstorm & list all options for reducing risks.

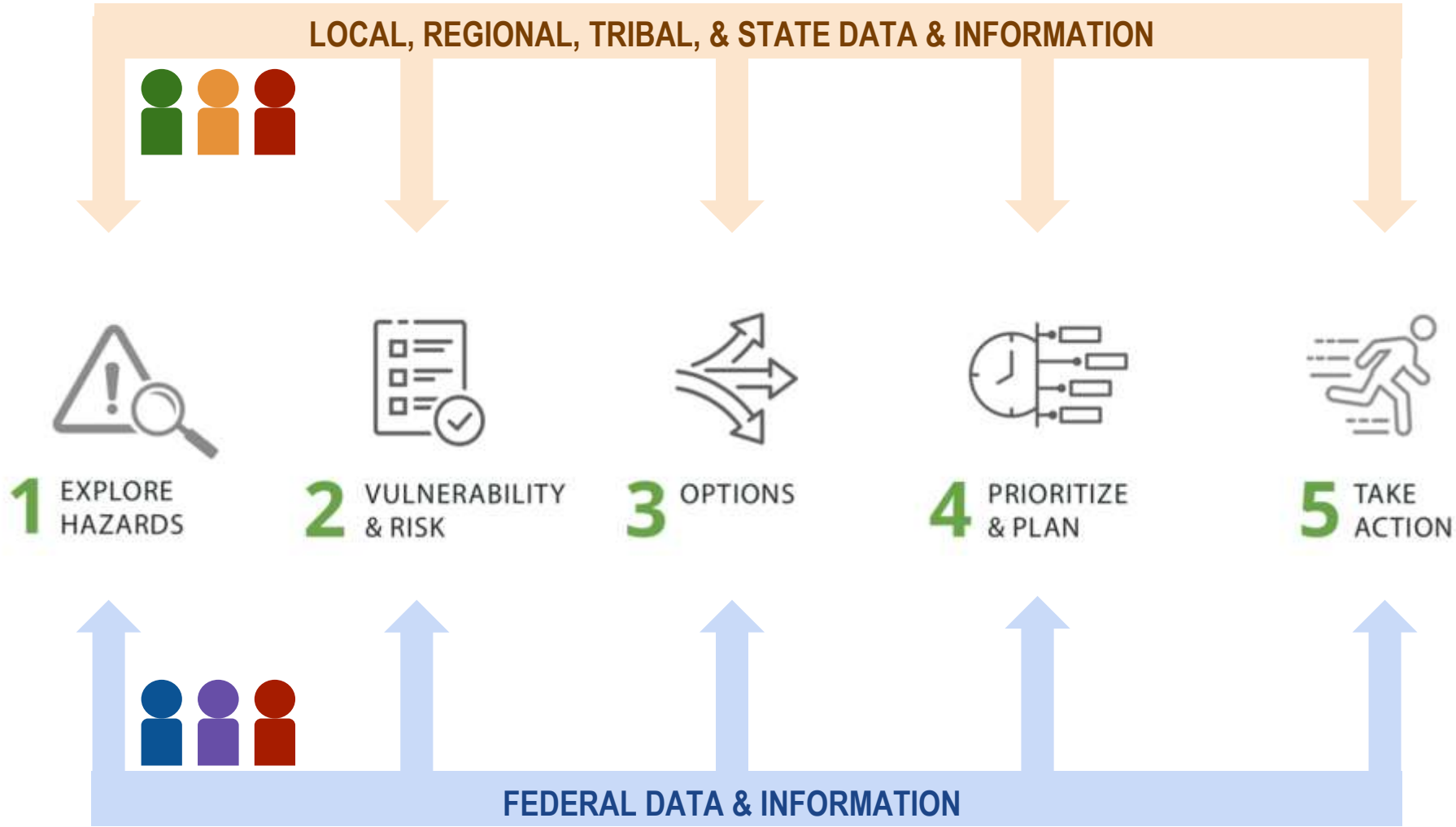


4 PRIORITIZE & PLAN

Rank options based on BCR assessment, select options to implement, define success metrics, & make an action plan.

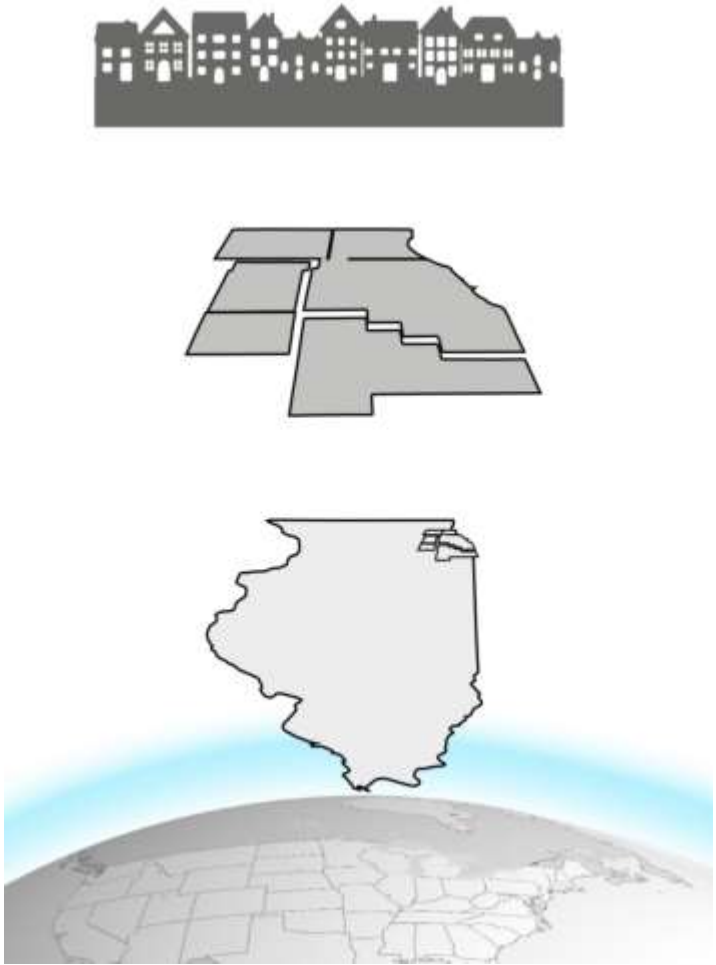
5 TAKE ACTION

Obtain funds, implement plan, monitor results, iterate as needed, & report progress & outcomes.


LOCAL, REGIONAL, TRIBAL, & STATE DATA & INFORMATION
1 EXPLORE HAZARDS
2 VULNERABILITY & RISK
3 OPTIONS
4 PRIORITIZE & PLAN
5 TAKE ACTION
FEDERAL DATA & INFORMATION

Aligning our goals, expertise, & resources from national to local

Aligning the goals & objectives of decision-makers at all scales, from global to local

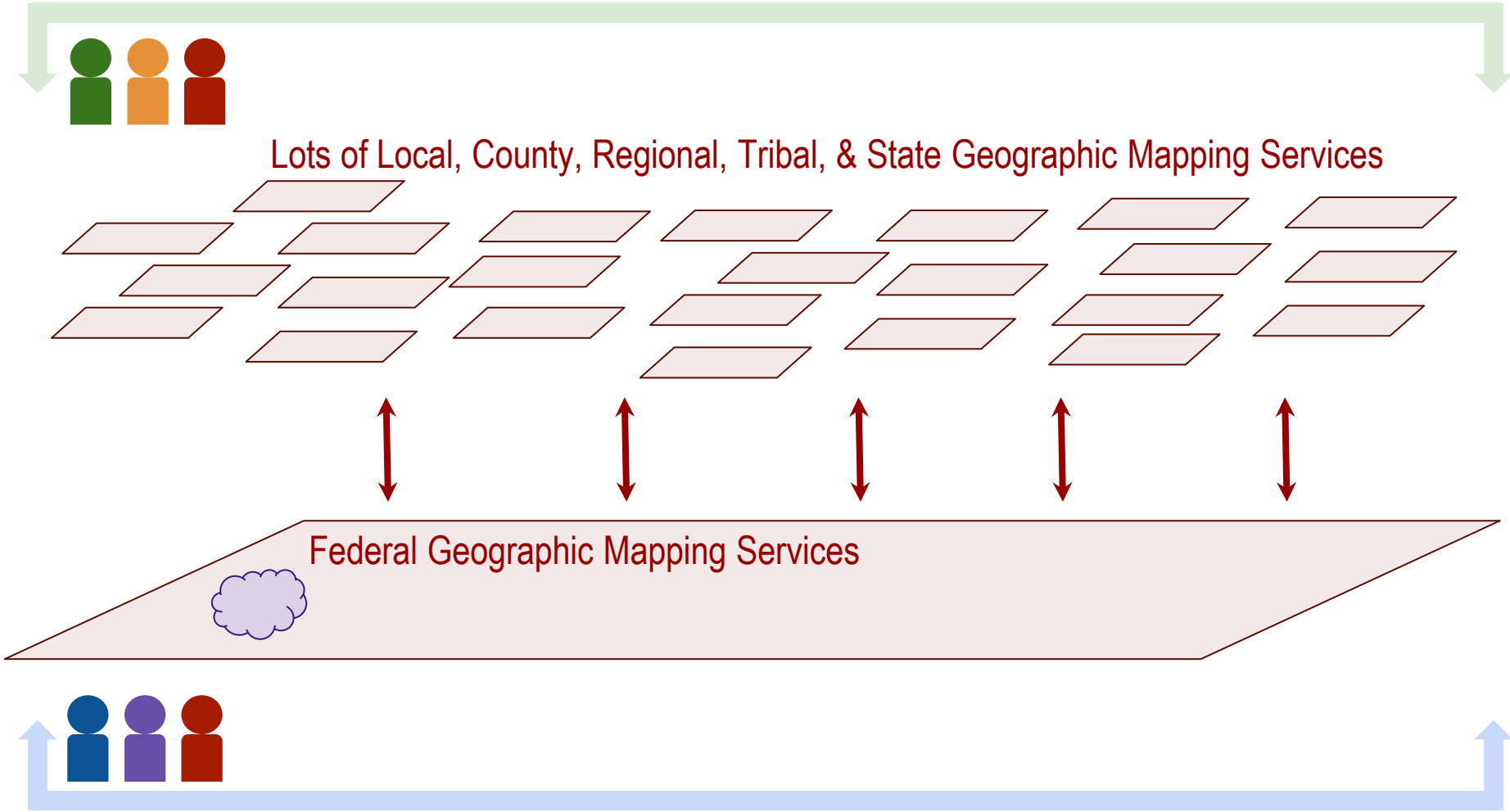


- **MUNICIPAL**
  Citizens & municipal leaders face climate-related hazards. Responsible for reducing vulnerability & risk, enhancing emergency response, & building resilience.

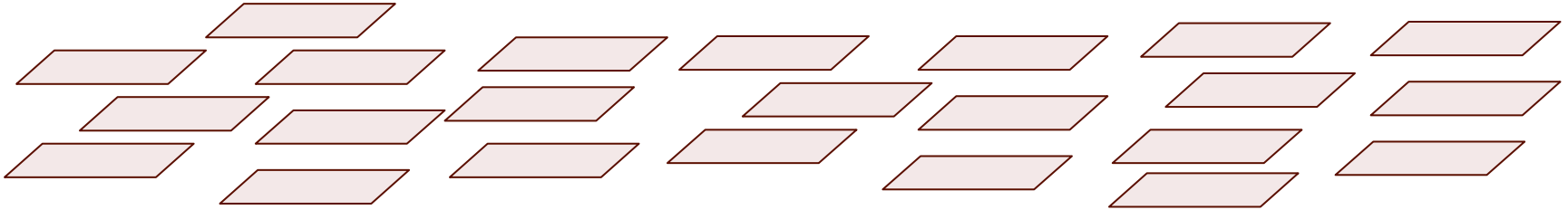
- **REGIONAL / TRIBAL**
  Regional & Tribal government entities focus on political efforts to lead & encourage local action, & enact relevant policies.

- **STATE**
  State governments can coordinate & support local resilience-building, provide funding and resources, align efforts, and coordinate with federal agencies..

- **NATIONAL / FEDERAL**
  Federal agencies provide science data & assessments, grant funding (FEMA/BRIC), the nation's GeoPlatform, & better coordination.


Lots of Local, County, Regional, Tribal, & State Geographic Mapping Services
Federal Geographic Mapping Services

Lots of Local, County, Regional, Tribal, & State Geographic Mapping Services



Decision Makers & Practitioners

U.S. Climate Resilience Toolkit

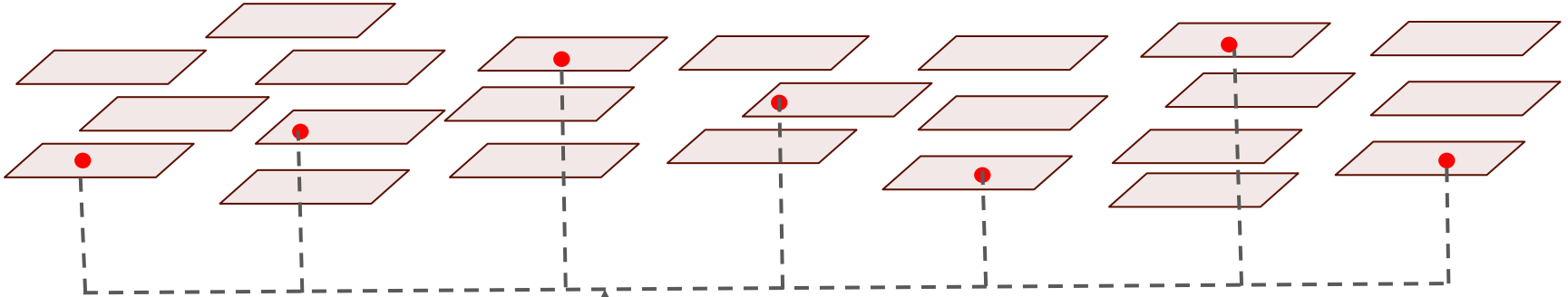
Seeking maps, tools, info, &/or expertise

Contextual Frames of Interest:

- Location/Geography
- Asset Types
- Climate Hazards
- Climate Variables
  - Threshold Exceedance
- Expertise &/or Experiences
- Funding Opportunities
- Tools for Taking Action (eg, StR)
- Time Period (historical, predictions, projections)
- Science Interpretation / Translation Services
- Socio-Economic Variables

Federal Geographic Mapping Services

Lots of Local, County, Regional, Tribal, & State Geographic Mapping & Info Services



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& Practitioners

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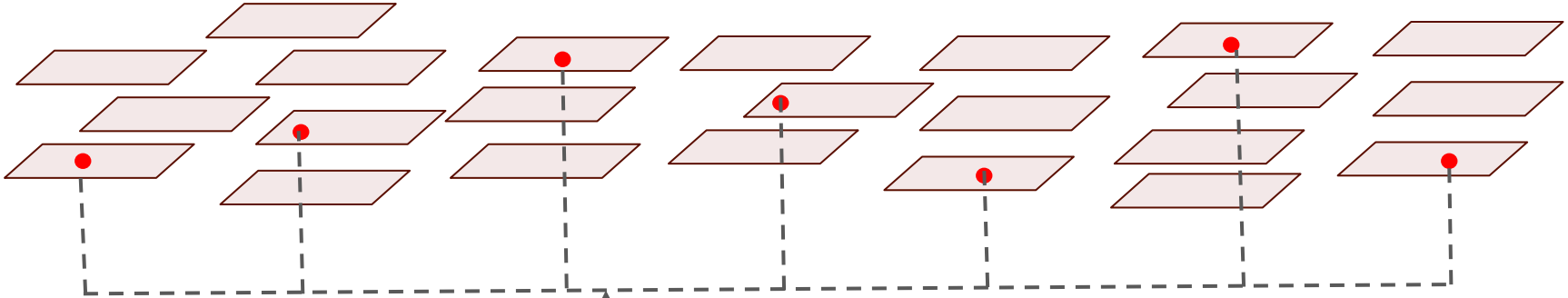


Decision Makers & Practitioners

U.S. Climate Resilience Toolkit

Seeking maps, tools, info, &/or expertise

Other Fed Websites

Academia & NGOs' Websites

Commercial Websites

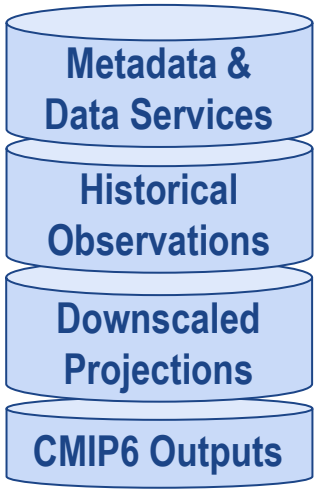
Seeking maps, tools, info, &/or expertise

There is no wrong door!

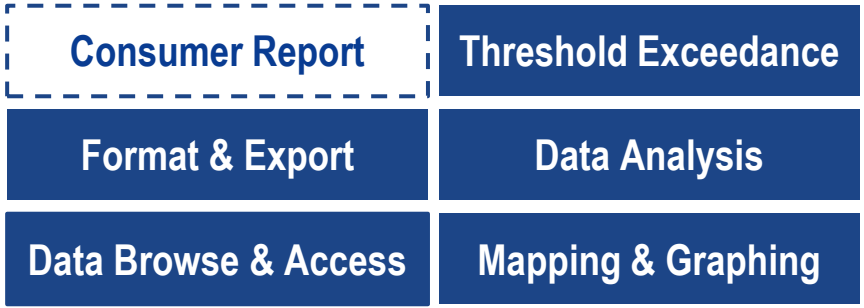
Users will find the needle no matter which haystack they look in.

Federal Geographic Mapping Services

Climate Resilience Information System (CRIS)



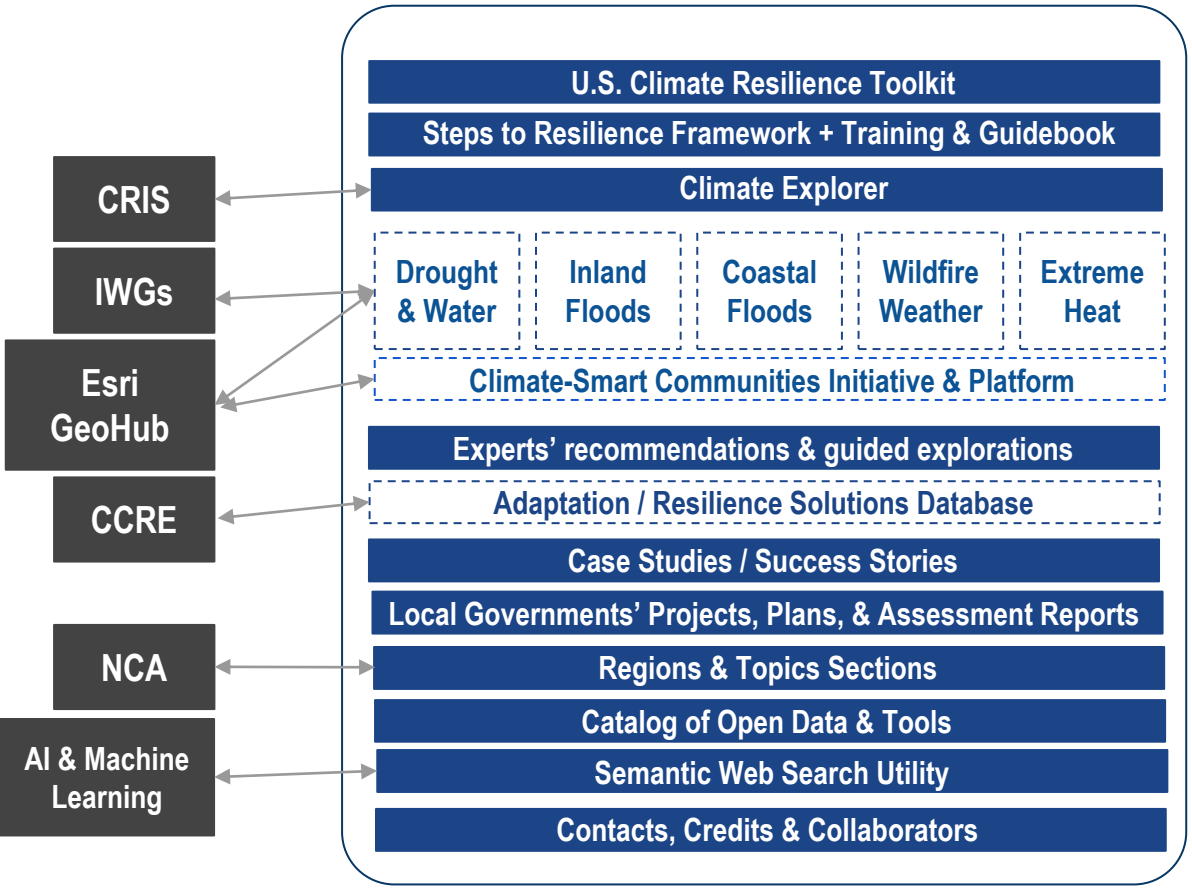
DECISION-RELEVANT
FEDERAL DATA LAKE



OPEN ACCESS / OPEN-SOURCE TOOL
DEVELOPERS WORKBENCH
(ANALYTICAL SERVICES)

FEDERAL GEOSPATIAL
DATA & SERVICES

U.S. Climate Resilience Toolkit (USCRT)



Esri's (or like) Knowledge-Sharing Platform:

Dashboards, Community Hubs, Story Maps, ArcGIS Online

U.S. Climate Resilience Toolkit

Steps to Resilience Framework + Training & Guidebook

Climate Explorer

Drought & Water | Inland Floods | Coastal Floods | Wildfire Weather | Extreme Heat

Climate-Smart Communities Initiative & Platform

Experts' recommendations & guided explorations

Adaptation / Resilience Solutions Database

Case Studies / Success Stories

Local Governments' Projects, Plans, & Assessment Reports

Regions & Topics Sections

Catalog of Open Data & Tools

Semantic Web Search Utility

Contacts, Credits & Collaborators

Extreme Heat Hub / Portal

Current Conditions: Maps & Dashboards

Historical Data

Predictions & Projections

Tools & Apps for Planning & Response

Platform(s) for Stakeholder Participation

Grants & Funding Opportunities

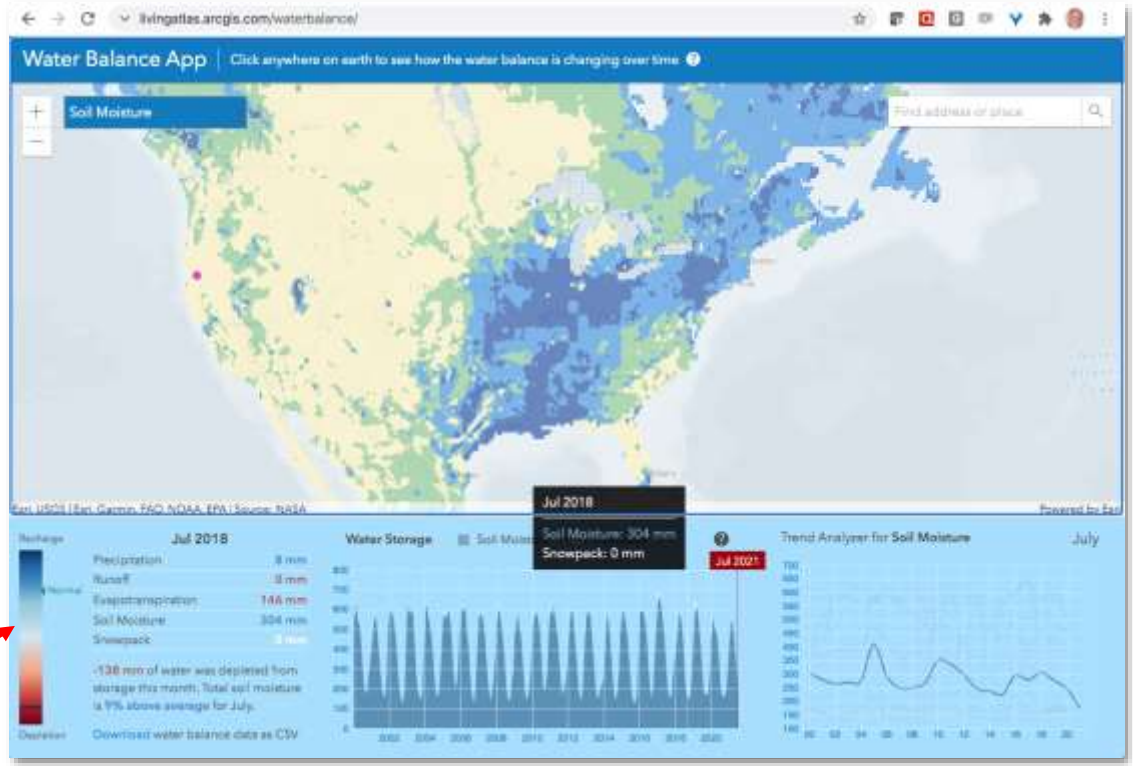
Contacts, Credits & Collaborators

3-legged Stool =>

- Subject Experts
- Audience Experts
- Medium Experts

Esri Hub example...

...linking to a relevant NASA app...



...offering interactive maps, charts, & plain-language interpretation.

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Smalltown, LA

Local Resilience Hub / Portal

Current Conditions: Maps & Dashboards

Local Data | Federal Data

Tools & Apps for Planning & Response

Platform(s) for Stakeholder Participation

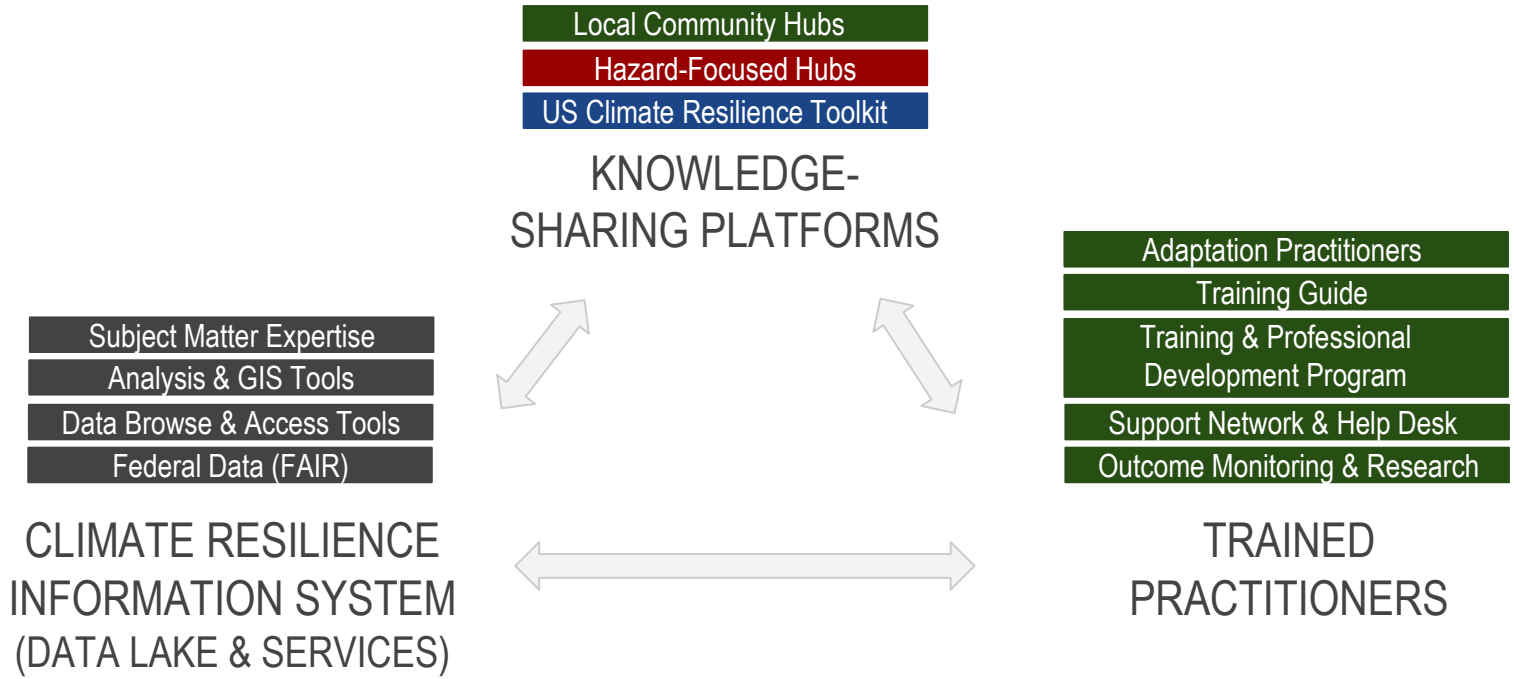
Other components…?

Contacts, Credits & Collaborators

3-legged Stool =>

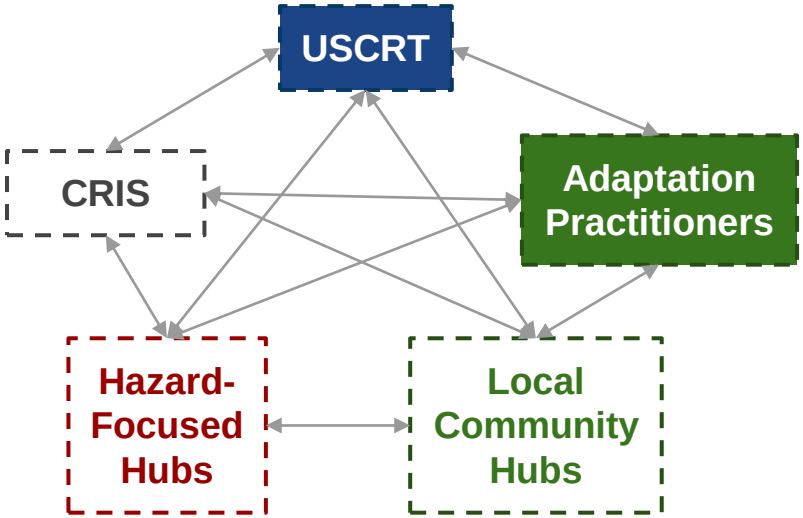
- Local Champions
- Adapt. Practitioners
- Medium Experts

A National Climate Resilience Framework

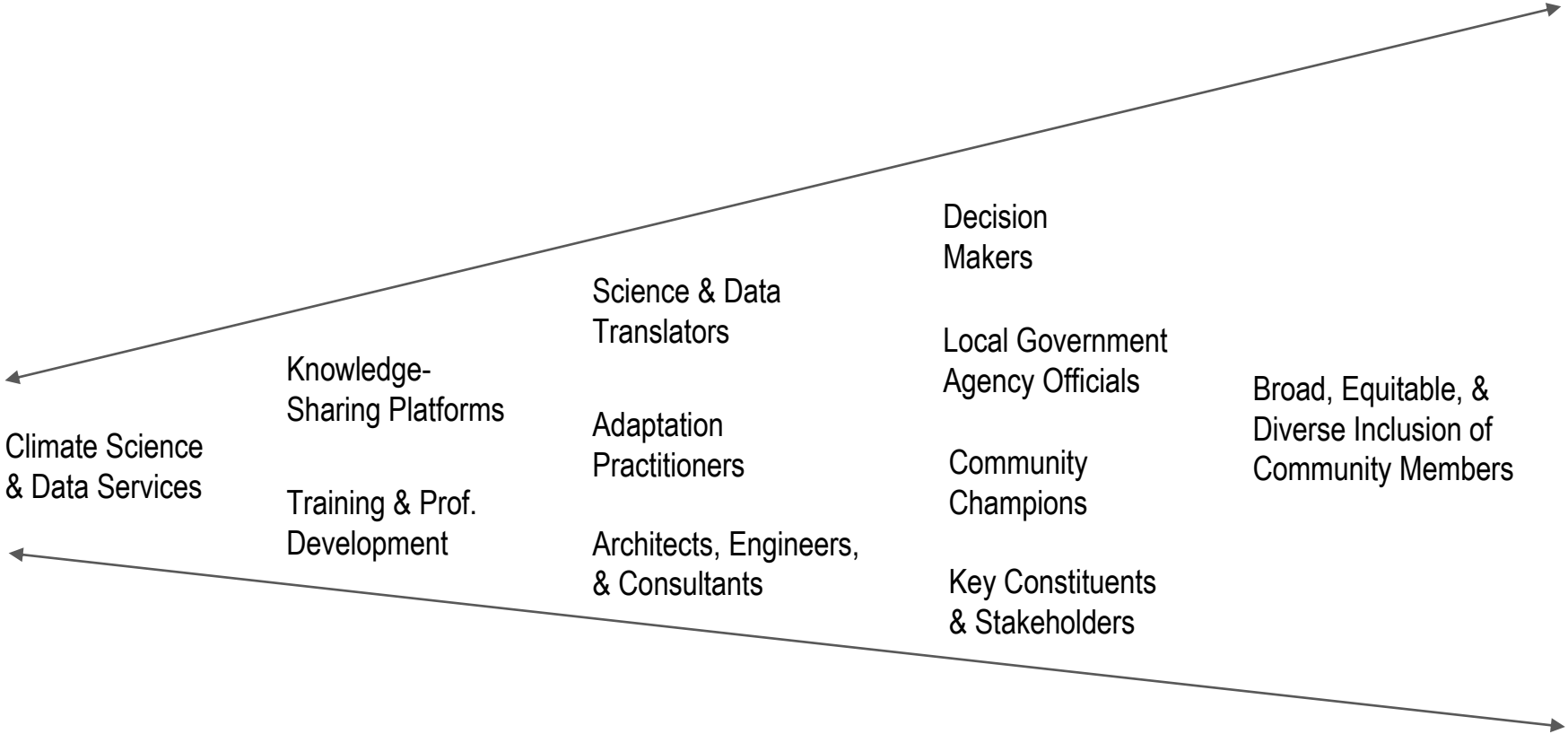


A National Climate Resilience Framework

= Exists
= Doesn't exist



Megaphone model of the climate services ecosystem



CRIS	Knowledge Hubs/Platforms	Trained Practitioners	Planners & Policy Leaders	Local / Tribal Communities

Current Status & Next Steps for CRIS

- Lit review & survey community of existing, relevant partners, tools, & data
- Formed general plans to integrate CMIP6, downscaled projections, & historical observations
- Rapid prototyping web Hubs underpinned by GIS technologies, for example:
  - The Opportunity Project
  - The USGCRP Heat and Health Group
- Forming CRIS core team at USGCRP:
  - A. Name (USGS)
  - David Herring (NOAA)
  - Jay Hnilo (DOE)
  - Kevin Murphy (NASA)
- Core team will produce CRIS scope & requirements document (Jan. 2022)
- Gathering ideas, feedback, & volunteers who want to contribute; contacts:
  - Mike Kuperberg => mkuperberg@usgcrp.gov
  - Fred Lipschultz => flipschultz@usgcrp.gov
  - David Herring => david.herring@noaa.gov